Advanced RF Mapping (RadioMap) Phase 3
USMC Electromagnetic Spectrum Operations (EMSO)
Operational Context For RF Mapping

January 6, 2014

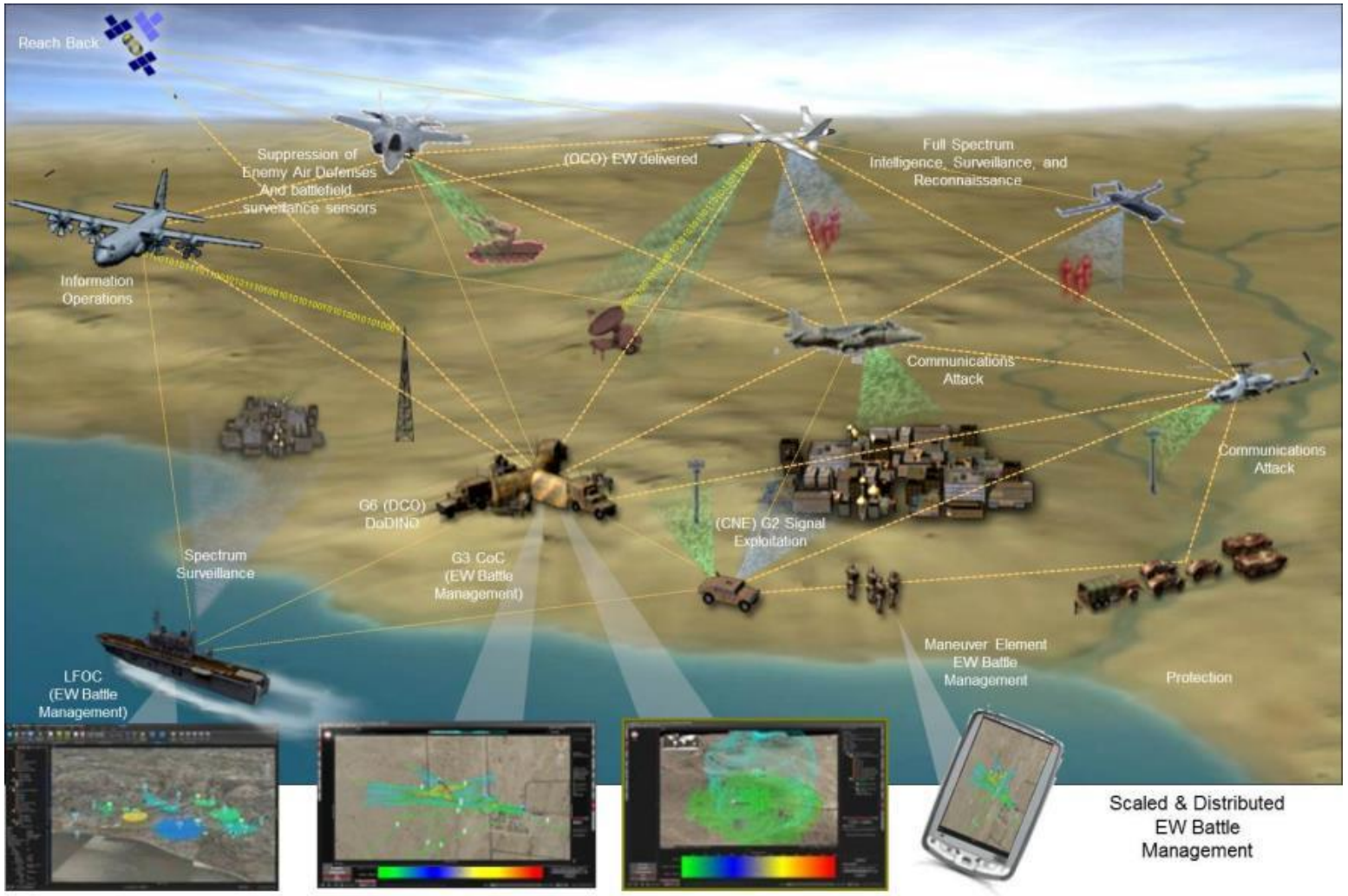
Briefing Goals

- Provide context on Marine Air Ground Task Force (MAGTF) electromagnetic spectrum operations (EMSO)
- Provide information relevant for transition of RF Mapping to the U. S. Marine Corps (USMC)
  - Existing conceptual and doctrinal conditions related to RadioMap Tactics Techniques & Procedures (TTP)
  - Existing and emerging technology related to RadioMap's transition

Summary

- USMC doctrine for EMS Operations is evolving
- To be successful, RadioMap must integrate into the overall USMC EMSO approach
  - Support commander visualization and maneuver
  - Feed into the CEWCC
  - Support the survey function of the EMSO kill chain
  - Assign appropriate roles to identified key performers
  - Integrate into the EWSA Service Oriented Architecture
  - Support activities specified in the OV-5
- WTI is one good environment to demonstrate and evaluate RadioMap in USMC EMSO
- Proposers should consider similar issues to the above for transition of the RF TAS to Tactical Unit Leaders

Marine Air-Ground Task Force (MAGTF) OV-1 for Electromagnetic Spectrum Operations (EMSO)

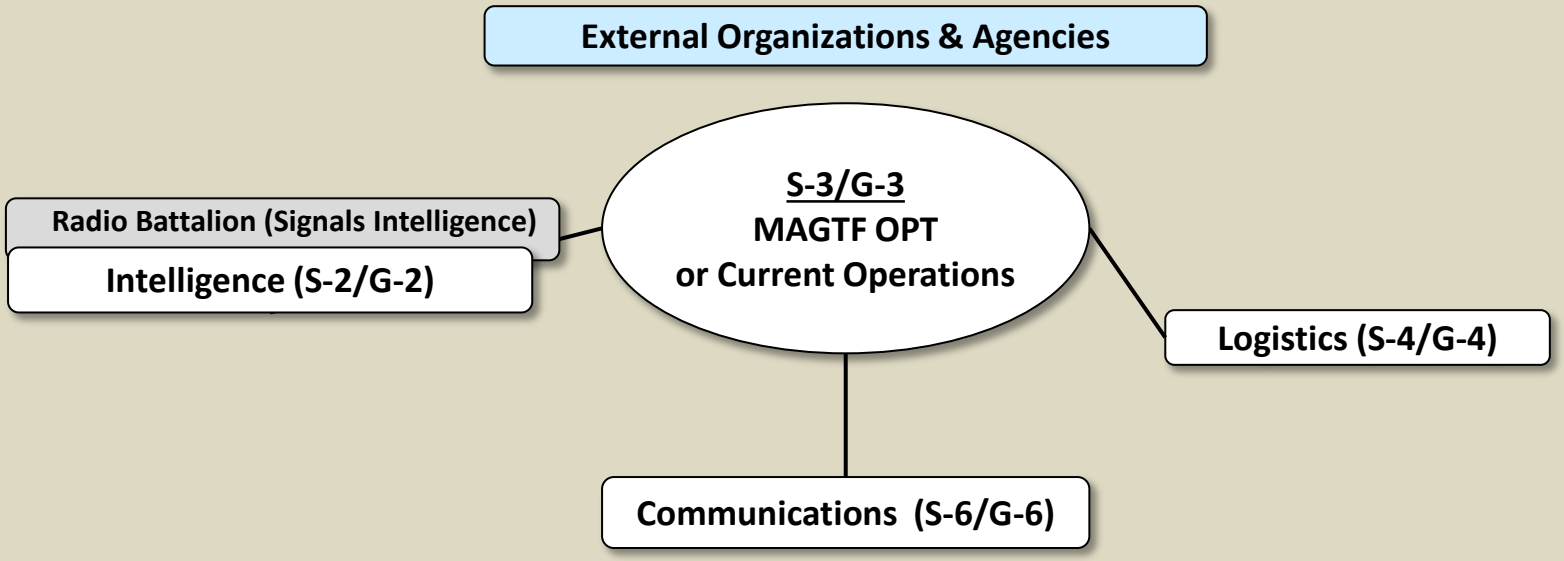


RadioMap must provide information to multiple nexus points in the MAGTF.
RadioMap must operate effectively despite intermittent network connectivity.

The Role of Spectrum

The six functional warfighting areas are command and control, maneuver, fires, intelligence, logistics, and force protection. The key advantage of using warfighting functions is they allow the commander and his planners to look at all aspects of the battlespace and not leave anything to chance if it is within their capability to coordinate, control, influence, and synchronize. (MCDP -1 *Marine Corps Operations*)

All functions use Cyberspace and the Electromagnetic Spectrum



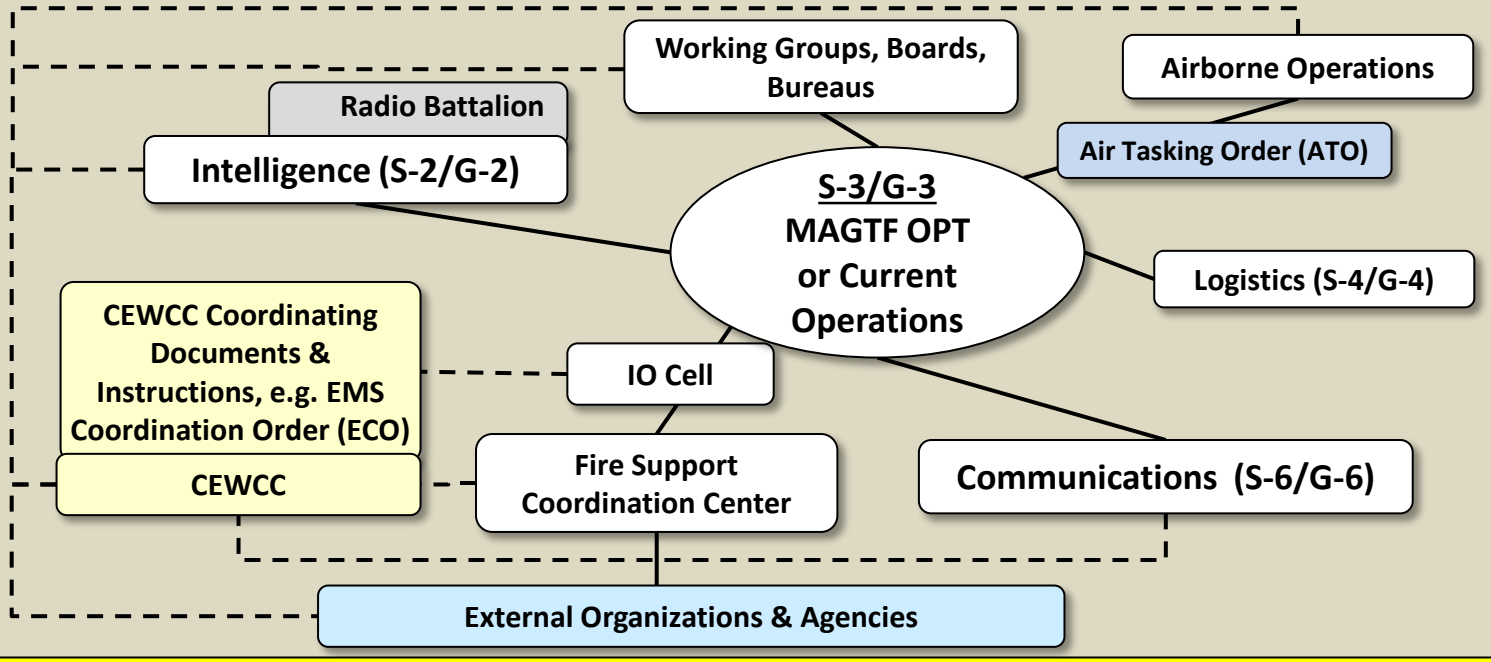
The Electromagnetic Spectrum (EMS) is now a critical maneuver domain. RadioMap enables commanders to visualize the EMS and articulate their vision.

Cyberspace and Electronic Warfare Coordination Cell (CEWCC) Integration Concept Summary

- The planning process is designed to promote understanding among the commander, his staff, and subordinate commanders regarding the nature of a given problem and the options for solving it (MCWP-5)
- C2 aims to reduce the amount of uncertainty that commanders must deal with—to a reasonable point—so they can make sound decisions (MCDP-6)

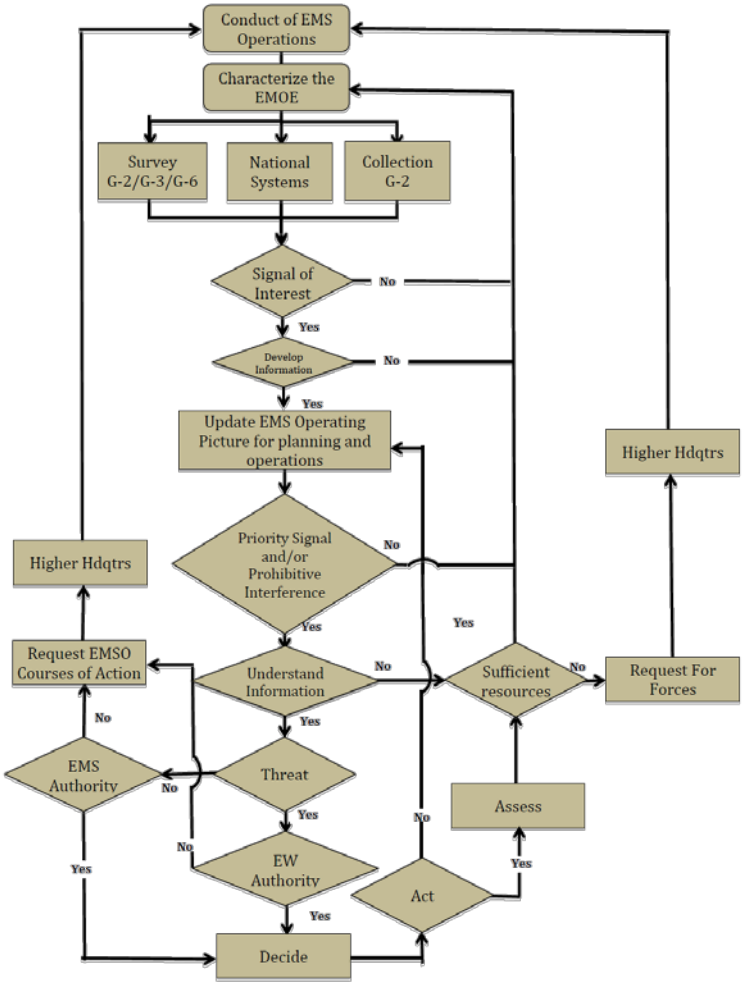
Cyberspace EW Coordination Cell (CEWCC) coordinates the integrated planning, execution, and assessment of MAGTF cyberspace and EMS actions across the MAGTF's operational environment in order to increase operational tempo and achieve military advantage.

CEWCC Coordination During MAGTF Planning and Execution



CEWCC is the emerging USMC structure for integrating EMS operations.
We expect broad benefits from feeding RadioMap data into the CEWCC.

RadioMap's role in MAGTF Planning and Execution



USMC EMSO Kill Chain

SURVEY - **<u>The timely and persistent coverage, both geospatially and in spectrum, of the electromagnetic environment.</u>**

COLLECT - To sense, record, process and share data for further analysis and reporting to higher authority.

DEVELOP INFORMATION--The identification, collection, filtering, fusing, processing, focusing, dissemination, and usage of information.

UNDERSTAND INFORMATION - In the context of the cognitive hierarchy, knowledge that has been synthesized and had judgment applied to it in a specific situation to comprehend the situation's inner relationships.

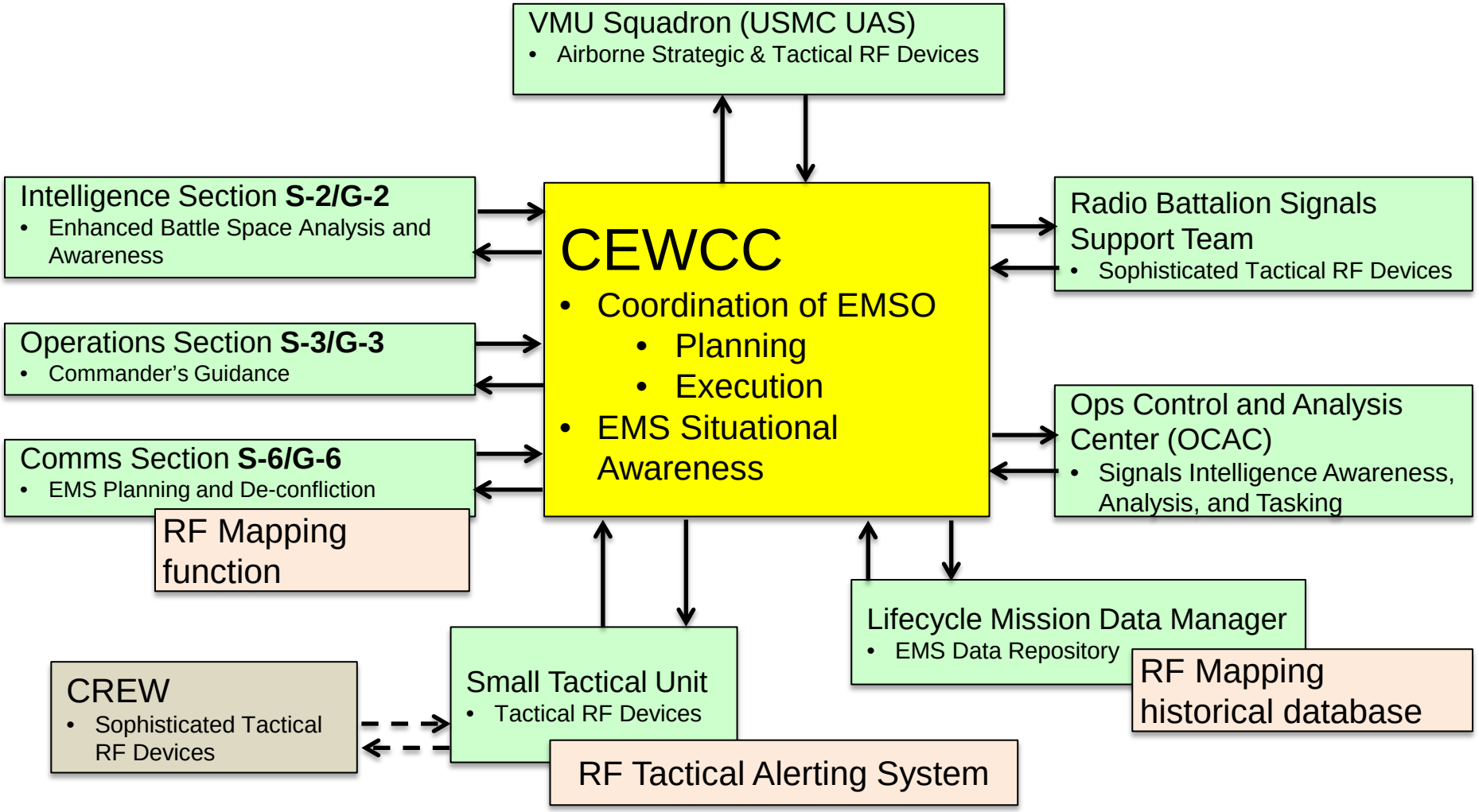
DECIDE - To make mission-appropriate action decisions with respect to the operational scheme of maneuver. Additionally, to appropriately assign and articulate tasking as a result of the decision-making process. Decisions may result in active or passive (do nothing/ignore) courses of action.

ACT - With respect to operational phasing, time and scheme of maneuver, an attempt to attain a desired effect. (HICAP)

ASSESS - To determine success of actions assigned and taken and share such results for further mission planning.

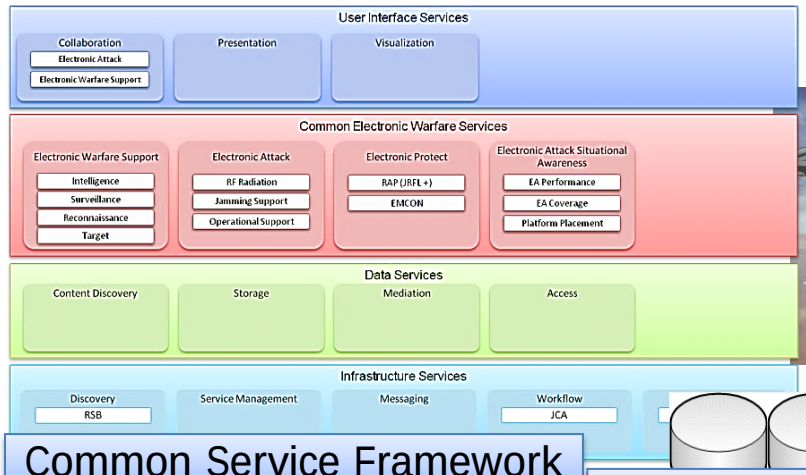
RadioMap provides a desired and new capability: timely, persistent, broad-area survey.

Simplified OV-2 (Identify Key Performers)



We expect S-6 (Spectrum Managers) will control the RF Mapping function. Many others will have User Interfaces to access the data.

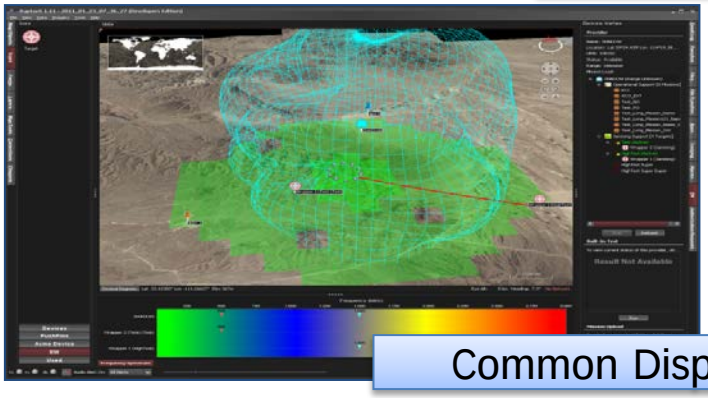
EW Services Architecture (EWSA)



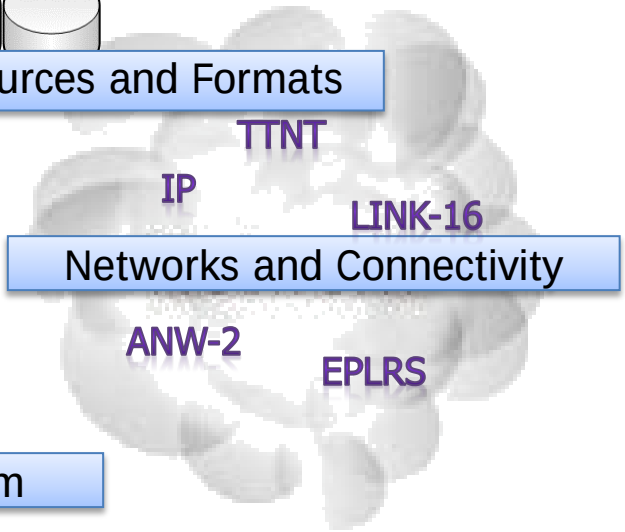
Common Service Framework

Net-Enabled Systems

Common Data Sources and Formats

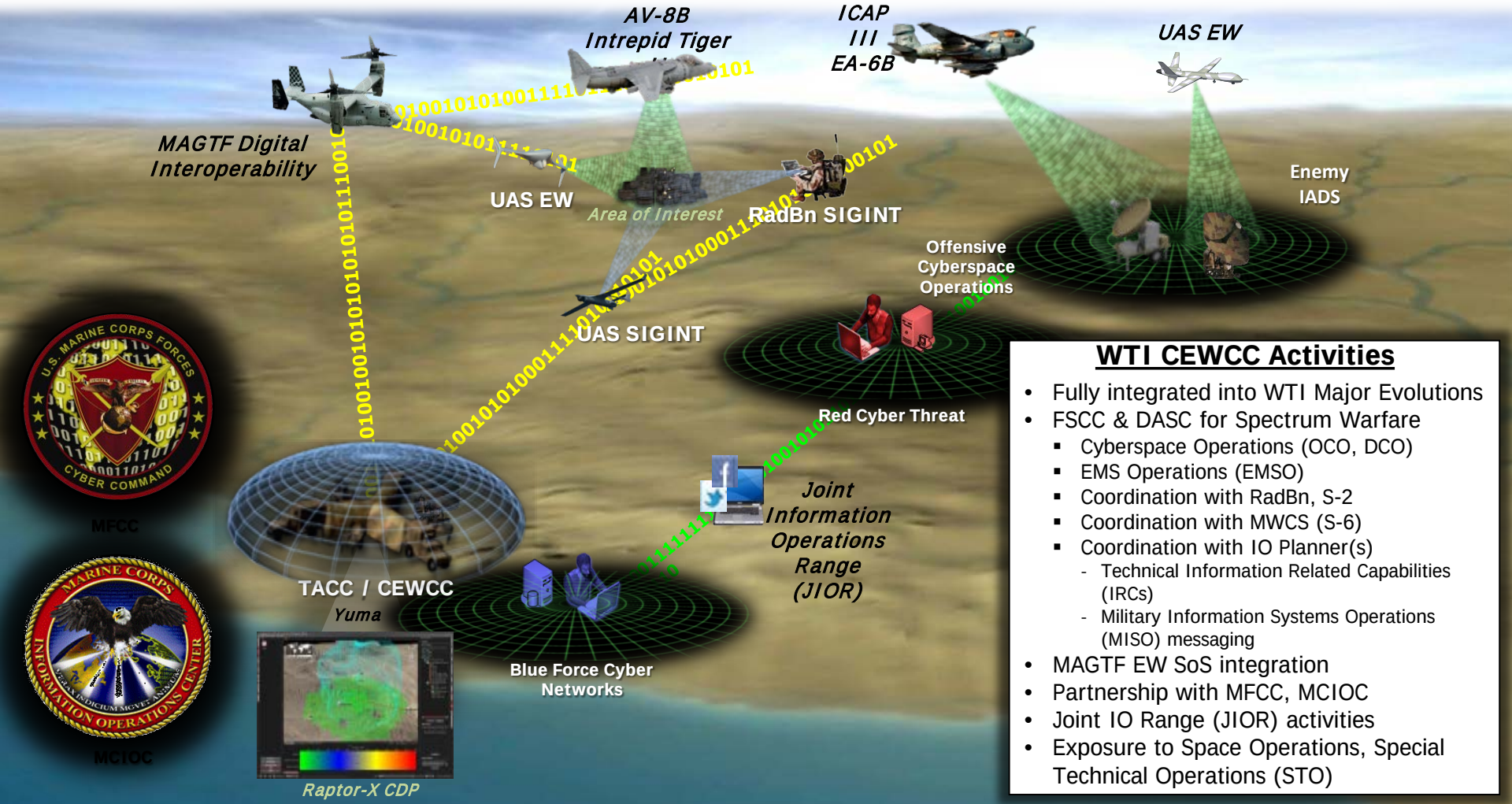


Common Display Platform



EWSA is the emerging Service Oriented Architecture for MAGTF EMSO.
We expect broad benefits from integrating RadioMap system into EWSA.

Activities of CEWCC at Weapons Tactics Instructor (WTI) Course



WTI CEWCC Activities

- Fully integrated into WTI Major Evolutions
- FSCC & DASC for Spectrum Warfare
  - Cyberspace Operations (OCO, DCO)
  - EMS Operations (EMSO)
  - Coordination with RadBn, S-2
  - Coordination with MWCS (S-6)
  - Coordination with IO Planner(s)
    - Technical Information Related Capabilities (IRCs)
    - Military Information Systems Operations (MISO) messaging
- MAGTF EW SoS integration
- Partnership with MFCC, MCIOC
- Joint IO Range (JIOR) activities
- Exposure to Space Operations, Special Technical Operations (STO)

The CEWCC will be carrying out multiple activities at WTI.
These are a good opportunity to demonstrate the benefits of RadioMap capability.

WTI 2-13 Flight Phase Calendar

April 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1	2	3	4	5	6
	Specifics flight phase					CEWCC UP
7	8	9	10	11	12	13
	China Lake Test	OAS-2	OAS-3	GBAD	OAS-4 China Lake	
14	15	16	17	18	19	20
	AST-1 Day Insert	AAW-1	AST-2 Night Raid	AAW-2	AST-3 NEO & HA/DR	OAAW
21	22	23	24	25	26	27
		FINEX 1		FINEX 2		FINEX 3
28	29	30				
Gr						

A typical WTI schedule lasts one month containing multiple different exercises. AST-1 to AST-3 exercises are the best opportunities for RadioMap demonstration.

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